

Attorney Docket No.:
108347-00017

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of: Maurice Clarence Kemp, Robert Blaine Lalum, David E. Lewis, and Robert H. Carpenter

Serial No.: 09/655,131

Filed: 09/05/00

For: HIGHLY ACIDIC METALATED ORGANIC ACID

Group No.: 1616

Examiner: John D. Pak

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION UNDER 37 C.F.R. § 1.132

ROBERT LALUM declares that:

1. I am a co-inventor of, and familiar with, the present U.S. Patent Application Serial No. 09/655,131, filed Sept. 5, 2000, in the name of Maurice C. Kemp, et al., and entitled "Highly Acidic Metalated Organic Acid." I am also familiar with the Official Action dated January 28, 2004 issued therein.

2. I am over 21 years old. I have worked as a research scientist specializing in acidic chemical formulations for the last 6 years for Mionix Corporation, assignee of the present application. I graduated from California Polytechnic State University in San Luis Obispo in June 1998 with a BS in Animal Science and a heavy concentration in courses on pre-veterinary medicine, biology, and chemistry.

3. I personally prepared and conducted experiments described below to demonstrate the differences between the organic acid added directly to the system of the present invention and the organic acid generated in situ from a salt of the organic acid by a strong regenerating acid in the system of the present invention. The salts of the organic acid that I used included a monovalent salt and a divalent salt. The strong regenerating acids that I used in the experiments included sulfuric acid and AGIIS, i.e. acid generated from sulfuric acid and calcium hydroxide.

4. For these experiments six test solutions were prepared for comparison. The test solutions were:

- (a) Sulfuric acid and lactic acid, (i.e. a mixture of a strong acid and an organic acid);
- (b) Sulfuric acid and calcium lactate, (i.e. a mixture of the same strong acid as in (a) above and a divalent salt of the same organic acid of (a) above, in which the organic acid was regenerated by the strong acid in solution, rather than added directly);
- (c) Sulfuric acid and sodium lactate, (i.e. a mixture of the same strong acid as in (a) above and a monovalent salt of the same organic acid of (a) above, in which the organic acid was regenerated by the strong acid in solution, rather than added directly);
- (d) AGIIS and lactic acid, (i.e. a mixture of a strong acidic composition and the same organic acid as in (a) above);
- (e) AGIIS and calcium lactate, (i.e. a mixture of the same strong acidic composition as in (d) above and a divalent salt of the same organic acid of (a) and (d) above, in which the organic acid was regenerated by the strong acidic composition in solution, rather than added directly); and
- (f) AGIIS and sodium lactate, (i.e. a mixture of the same strong acidic composition as in (d) above and a monovalent salt of the same organic acid of (a) and (d) above, in which the organic acid was regenerated by the strong acidic composition in solution, rather than added directly);

Each test solution had a final pH of approximately 1.50 and a lactate concentration of approximately 100,000 ppm.

5. A stainless steel coupon weighing 90.0 grams and having dimensions of 1.5 inch by 1.5 inch by 0.25 inch was immersed into 200 mL of each of the three test solutions. The test solutions containing the stainless steel coupons were placed into an incubator at 80°C for 24 hours.

6. The ability of each of the test solutions to extract metals from stainless steel was measured by testing the increase in the amount of nickel, iron, and chromium present in each solution with an Inductive Coupled Plasma Spectrometer ("ICP") machine. Each of the test solutions was measured three times and the values were averaged.

7. Test #1: After subtracting the control, the amount of nickel present in the test solutions was: (i) 0.64 ppm in the mixture of sulfuric acid and lactic acid; (ii) 0.17 ppm in the mixture of sulfuric acid and calcium lactate; and (iii) 0.91 ppm in the mixture of sulfuric acid and sodium lactate.

8. Test #2: After subtracting the control, the amount of iron present in the test solutions was: (i) 6.71 ppm in the mixture of sulfuric acid and lactic acid; (ii) 2.32 ppm in the mixture of sulfuric acid and calcium lactate; and (iii) 8.42 ppm in the mixture of sulfuric acid and sodium lactate.

9. Test #3: After subtracting the control, the amount of chromium present in the test solutions was: (i) 0.47 ppm in the mixture of sulfuric acid and lactic acid; (ii) 0.17 ppm in the mixture of sulfuric acid and calcium lactate; and (iii) 0.02 ppm in the mixture of sulfuric acid and sodium lactate.

10. Test #4: After subtracting the control, the amount of nickel present in the test solutions was: (i) 2.50 ppm in the mixture of AGIIS and lactic acid; (ii) 0.17 ppm in the mixture of AGIIS and calcium lactate; and (iii) 0.27 ppm in the mixture of AGIIS and sodium lactate.

11. Test #5: After subtracting the control, the amount of iron present in the test solutions was: (i) 25.45 ppm in the mixture of AGIIS and lactic acid; (ii) 11.75 ppm in the mixture of AGIIS and calcium lactate; and (iii) 6.50 ppm in the mixture of AGIIS and sodium lactate.

12. Test #6: After subtracting the control, the amount of chromium present in the test solutions was: (i) 0.83 ppm in the mixture of AGIIS and lactic acid; (ii) 0.79 ppm in the mixture of AGIIS and calcium lactate; and (iii) 0.39 ppm in the mixture of AGIIS and sodium lactate.

13. The comparison of the six test solutions above demonstrates that the direct addition of a strong acid and an organic acid gives a solution with different properties than a solution of a strong acid and the salt of the same organic acid (wherein the strong acid generates the organic acid in situ from the salt of the organic acid). In each test performed, the reactivity of each acidic solution having the same pH was different, depending on whether the organic acid was added directly to the strong acid (as in the first solution, namely, (i), in each test) or regenerated in situ from its salt (as in the second and third solutions, namely, (ii) and (iii), in each test.) by the strong acid.

14. The comparison of the six test solutions above also demonstrates that an acidic solution of a strong regenerating acid and a salt of an organic acid has unique properties regardless of whether the salt is monovalent or divalent. Solutions using divalent calcium salts as well as monovalent sodium salts showed different reactivity when compared to solutions of a strong acid and an organic acid mixed directly and having the same pH.

15. The comparison of the six test solutions above also demonstrates that an acidic solution of a strong regenerating acid and a salt of an organic acid has unique properties regardless of whether the strong regenerating acid is sulfuric acid or AGIIS. Solutions using sulfuric acid as well as AGIIS showed different reactivity when compared to solutions of a strong acid and an organic acid mixed directly and having the same pH.

16. The comparison of the six test solutions above demonstrates that the regeneration of the organic acid from its salt by a strong acid does not necessarily give the same solution as would be obtained by the addition of the free, but same, organic acid to the acidic solution.

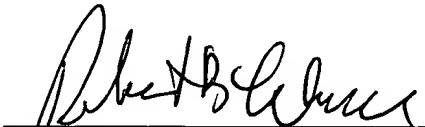
17. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are

Attorney Docket No.:
MORN-0006 (108347.00017)

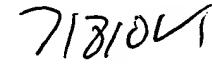
PATENT

punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,



Robert Lalum



Date